



University of  
Pittsburgh

# Algorithms and Data Structures 2

## CS 1501

Spring 2022

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(Slides are adapted from Dr. Ramirez's and Dr. Farnan's CS1501 slides.)

# Announcements

- In-person recitations this week (tomorrow)
- In-person lectures starting from next week
- Upcoming Deadlines
  - Homework 1: today at 11:59 pm
  - Homework 2: Monday 1/31 at 11:59 pm
  - Lab 1: Friday 1/28 at 11:59 pm
- Assignment 1 not yet posted (sorry about that)
- CourseMIRROR consent form and pre-survey

# Previous lecture

- Searching Problem
- Symbol Table ADT implementations
  - Linear
    - array, linked list
  - Non-linear
    - tree
- Tree terminology
- Binary Tree
- Binary Search Tree

# CourseMIRROR Reflections

# Searching Problem

- Input?
- Output?

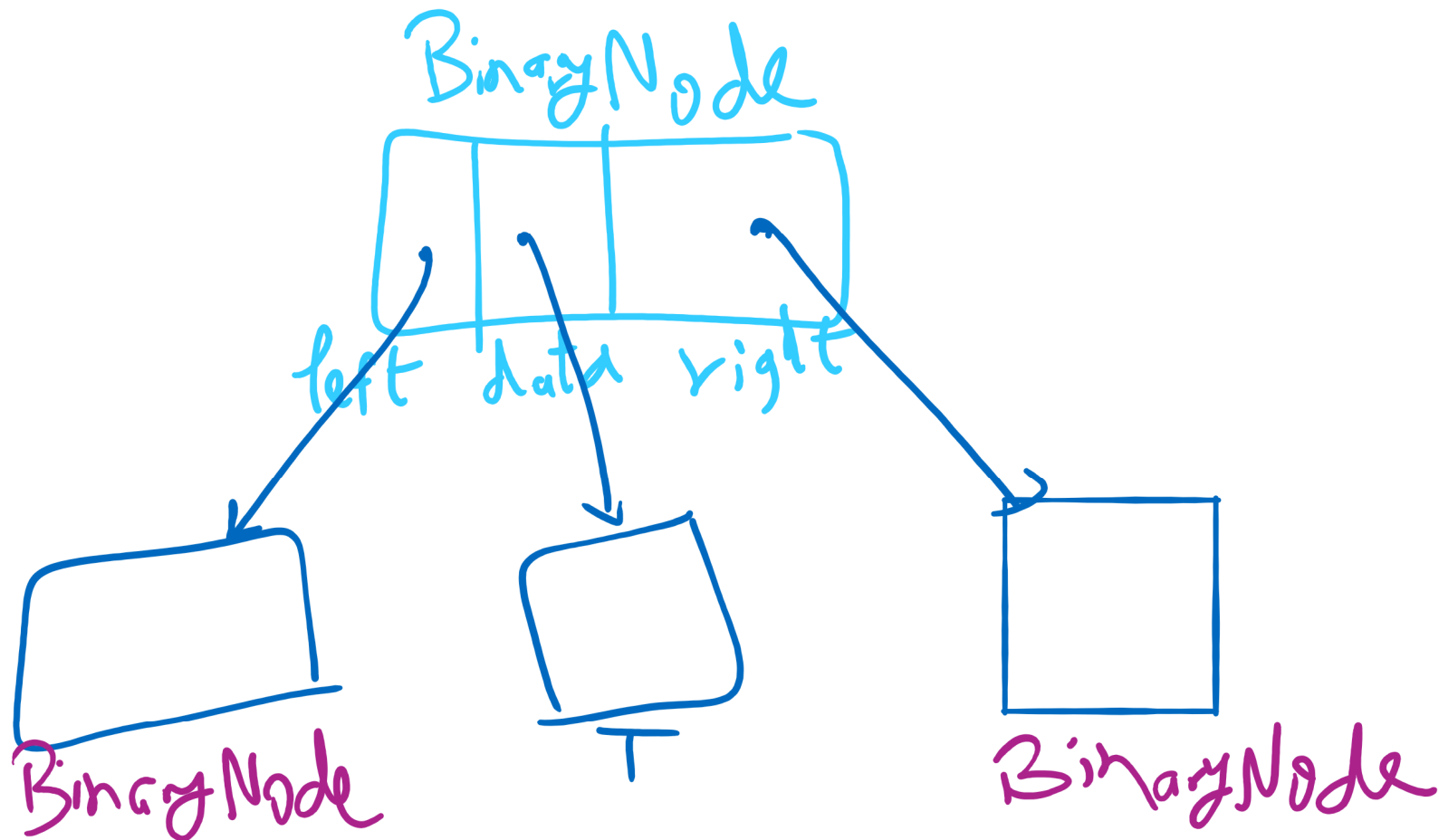
# Tree Interface

```
public interface TreeInterface<T> {  
    public T getRootData() throws EmptyTreeException;  
    public int getHeight() throws EmptyTreeException;  
    public int getNumberOfNodes() throws EmptyTreeException;  
    public boolean isEmpty();  
    public void levelOrderTraverse();  
    public void clear();  
}
```

# Code Walkthrough

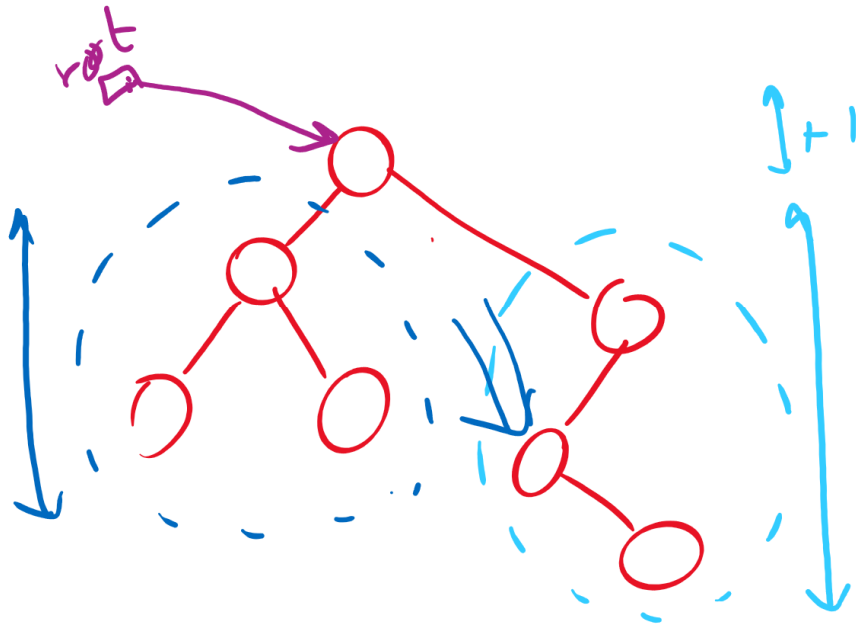
- Available online at:
  - <https://cs1501-2221.github.io/handouts/CodeHandouts/TreeADT/Slides>
  - The slides are under the CodeHandouts/TreeADT/slides folder in the handout repository
  - <https://github.com/cs1501-2221/handouts>

# BinaryNode



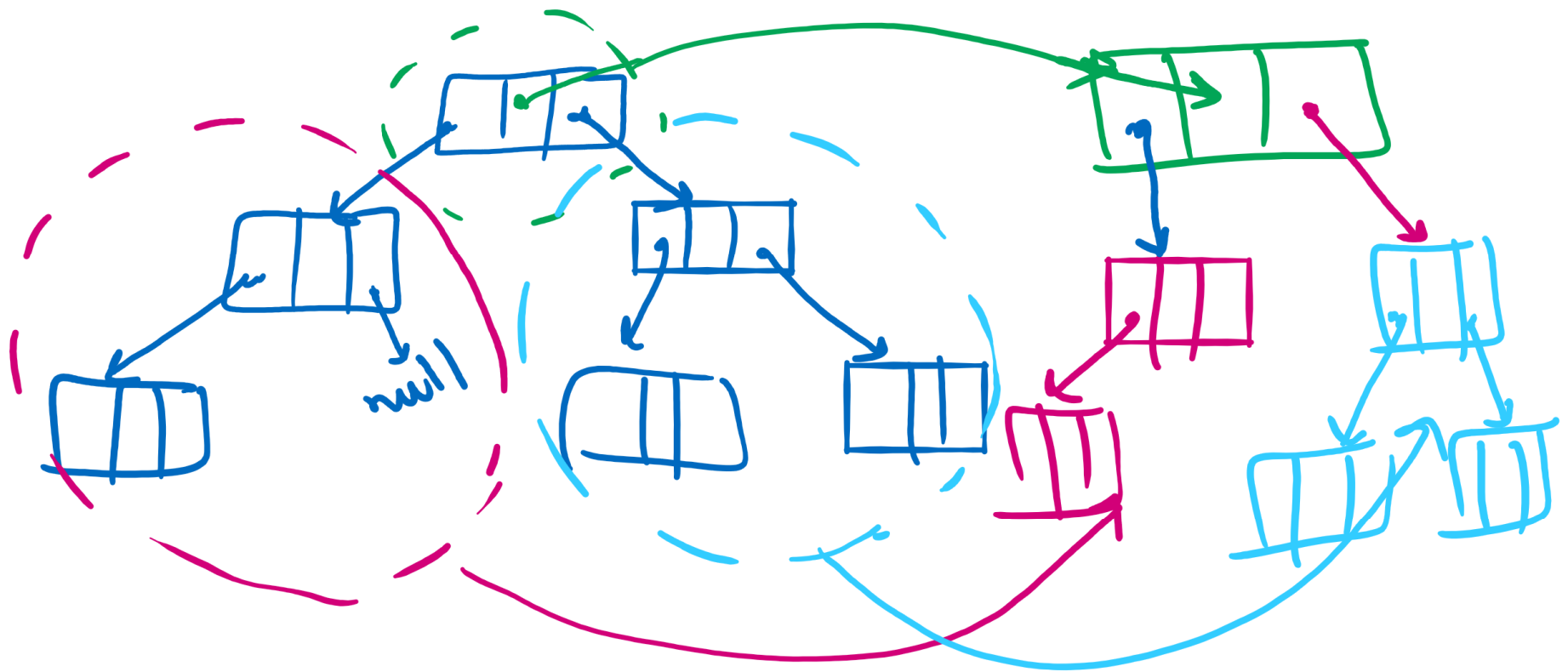


# Another implementation of getHeight

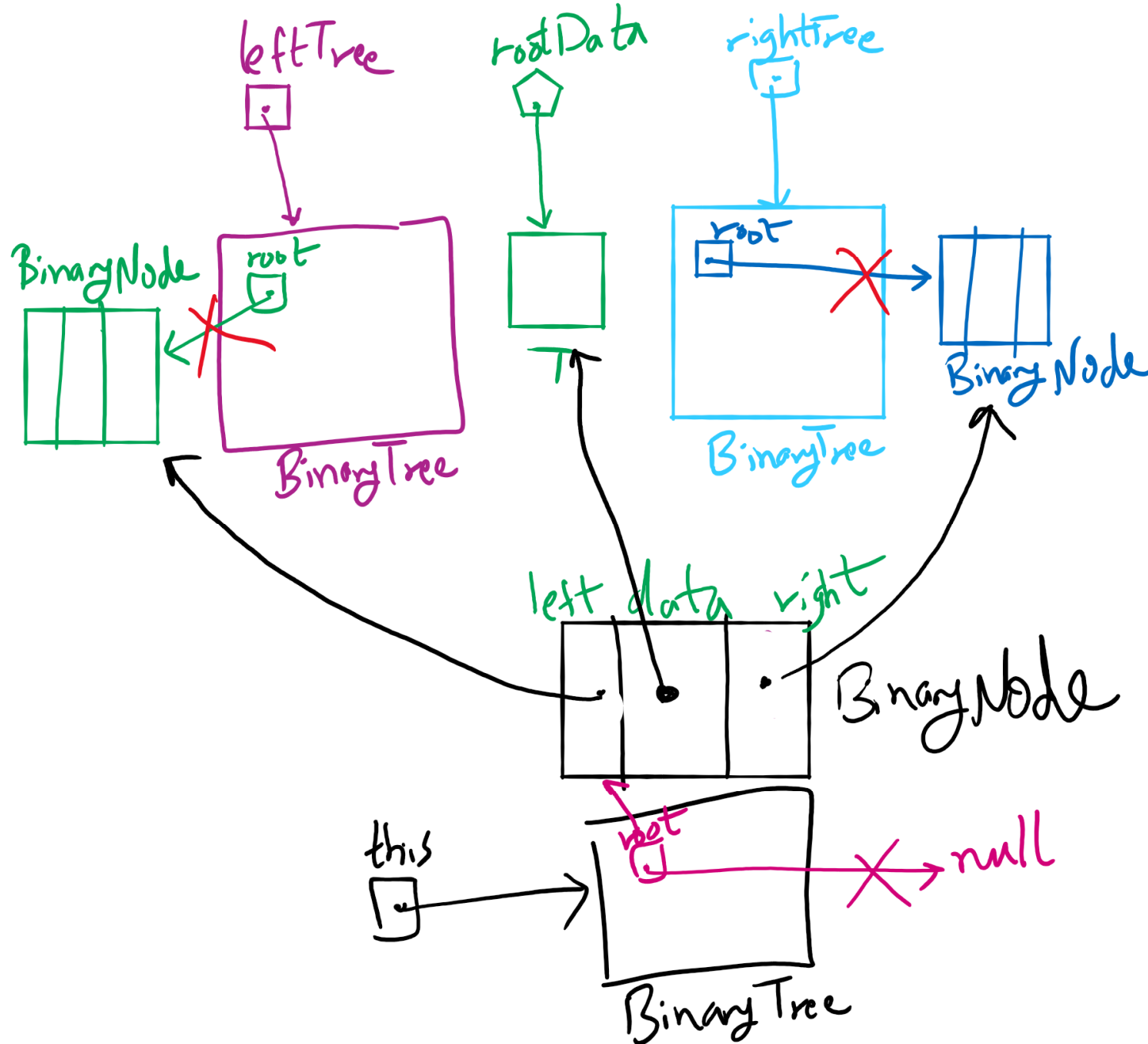


```
int getHeight(BinaryNode<T> root) {  
    int lHeight = 0;  
    int rHeight = 0;  
    if (root.left != null)  
        lHeight = getHeight(root.left);  
    if (root.right != null)  
        rHeight = getHeight(root.right);  
    return Math.max(lHeight, rHeight) + 1;  
}
```

# BinaryNode.copy



# privateBuildTree Method



# Please submit your reflections by using the CourseMIRROR App

If you are having a problem with CourseMIRROR, please send an email to [coursemirror.development@gmail.com](mailto:coursemirror.development@gmail.com)

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